

CLAIMS:

1. A deposition method comprising:

contacting a substrate with a first initiation precursor and forming a first portion of an initiation layer on the substrate; and

contacting at least a part of the substrate with a second initiation precursor different from the first initiation precursor and forming a second portion of the initiation layer on the substrate.

2. The deposition method of claim 1, wherein the initiation layer consists essentially of a monolayer of the first and second initiation precursors.

3. The deposition method of claim 1, wherein the contacting with the first initiation precursor and the contacting with the second initiation precursor occur simultaneously.

4. The deposition method of claim 1, wherein substantially all of the first portion of the initiation layer is continuous and at least some of the second portion of the initiation layer is not continuous.

1 5. The deposition method of claim 1, wherein the second
2 portion of the initiation layer forms on the substrate in a region less
3 susceptible to formation of the first portion of the initiation layer than
4 to formation of the second portion.

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6 6. The deposition method of claim 1, wherein the first portion
7 of the initiation layer forms on an insulative portion of the substrate and
8 the second portion of the initiation layer forms on a conductive portion
9 of the substrate.

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11 7. The deposition method of claim 1, wherein the forming the
12 second portion of the initiation layer substantially fills holes in the first
13 portion of the initiation layer.

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15 8. The deposition method of claim 1, further comprising
16 contacting the first and second portions of the initiation layer with a
17 deposition precursor and forming a deposition layer on the first and
18 second portions of the initiation layer.

1 9. The deposition method of claim 8, further comprising
2 contacting the deposition layer with a third initiation precursor different
3 from both the first and second initiation precursor and forming a second
4 initiation layer on the deposition layer.

1 10. A deposition method comprising:
2 simultaneously contacting a substrate with a plurality of initiation
3 precursors; and

4 chemisorbing on the substrate an initiation layer comprising
5 components derived from each of the plurality of initiation precursors.
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7 11. The deposition method of claim 10, wherein the initiation
8 layer consists essentially of a monolayer.
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10 12. The deposition method of claim 10, wherein a portion of the
11 initiation layer derived from one of the plurality of initiation precursors
12 forms on the substrate in a region less susceptible to formation of the
13 initiation layer by another of the plurality of initiation precursors.
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15 13. The deposition method of claim 12, wherein the portion of
16 the initiation layer derived from the one initiation precursor substantially
17 fills holes in the initiation layer formed by the another initiation
18 precursor.
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1 14. The deposition method of claim 10, further comprising
2 contacting the initiation layer with a deposition precursor and forming
3 a deposition layer on one portion of the initiation layer derived from
4 one initiation precursor and on another portion of the initiation layer
5 derived from another initiation precursor.

1 15. A deposition method comprising:
2 providing a substrate having a first region and second region, the
3 first and second regions each having a property causing a difference
4 between the susceptibility of the first and second regions to formation
5 of an initiation layer by a first initiation precursor;
6 contacting the substrate with the first initiation precursor and
7 forming the initiation layer on the first region; and
8 contacting at least a part of the substrate with a second initiation
9 precursor and forming the initiation layer on the second region.

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11 16. The deposition method of claim 15, wherein the initiation
12 layer consists essentially of a monolayer on the first and second region.

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14 17. The deposition method of claim 15, wherein the first
15 initiation precursor forms a negligible, if any, amount of the initiation
16 layer on the second region.

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18 18. The deposition method of claim 15, wherein the contacting
19 with the first initiation precursor and the contacting with the second
20 initiation precursor occur simultaneously.

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1 19. The deposition method of claim 15, wherein substantially all
2 of the first region is continuous and at least some of the second region
3 is not continuous.

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5 20. The deposition method of claim 15, wherein either the first
6 or the second region is insulative and the other is conductive.

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8 21. The deposition method of claim 15, wherein the forming the
9 initiation layer on the second region substantially fills holes in the
10 initiation layer on the first region.

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12 22. The deposition method of claim 15, further comprising
13 contacting the initiation layer on the first and second regions with a
14 deposition precursor and forming a deposition layer on the initiation
15 layer on the first and second regions.

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17 23. The deposition method of claim 22, further comprising
18 contacting the deposition layer with a third initiation precursor different
19 from both the first and second initiation precursor and forming a second
20 initiation layer on the deposition layer.

1 24. A deposition method comprising:
2 contacting a substrate with a first initiation precursor and forming
3 a first initiation layer on the substrate;
4 contacting the first initiation layer with a deposition precursor and
5 forming a deposition layer on the first initiation layer; and
6 contacting at least the deposition layer with a second initiation
7 precursor different from the first initiation precursor, and forming a
8 second initiation layer over the substrate.

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10 25. The deposition method of claim 24, wherein the first
11 initiation layer, deposition layer, and second initiation layer each consist
12 essentially of a monolayer.

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14 26. The deposition method of claim 24, wherein the contacting
15 with the second initiation precursor further comprises contacting a
16 portion of the substrate on which the first initiation layer did not form
17 and wherein the forming the second initiation layer occurs on at least
18 such portion.

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20 27. The deposition method of claim 26, wherein the forming the
21 second initiation layer substantially fills holes in the first initiation layer.
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1 28. A deposition method comprising:
2 contacting a substrate with a first initiation precursor and forming
3 a first initiation layer on the substrate;
4 contacting the first initiation layer with a deposition precursor and
5 forming a deposition layer on the first initiation layer; and
6 contacting at least the deposition layer with a plurality of initiation
7 precursors, at least one of which is different from the first initiation
8 precursor, and forming a second initiation layer over the substrate.

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10 29. The deposition method of claim 28, wherein the first
11 initiation layer, deposition layer, and second initiation layer each consist
12 essentially of a monolayer.

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14 30. The deposition method of claim 28, wherein one of the
15 plurality of initiation precursors is the first initiation precursor.

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17 31. The deposition method of claim 28, wherein the contacting
18 with the plurality of initiation precursors occurs simultaneously.
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1 32. The deposition method of claim 28, wherein the contacting
2 with the plurality of initiation precursors further comprises contacting a
3 portion of the substrate on which the first initiation layer did not form
4 and wherein the forming the second initiation layer occurs on at least
5 such portion.

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7 33. The deposition method of claim 32, wherein the forming the
8 second initiation layer substantially fills holes in the first initiation layer.
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1 34. A deposition method comprising:
2 contacting a first-type surface of a substrate and a second-type
3 surface of a substrate different from the first-type surface with a first
4 initiation precursor and forming an initiation layer substantially selectively
5 on the first-type surface relative to the second-type surface; and
6 contacting the initiation layer with a deposition precursor and
7 forming a deposition layer substantially selectively over the first-type
8 surface relative to the second-type surface.

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10 35. The deposition method of claim 34, wherein the initiation
11 layer and deposition layer each consist essentially of a monolayer.

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13 36. The deposition method of claim 34, wherein substantially all
14 of the first-type surface is continuous and at least some of the second-
15 type surface is not continuous.

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17 37. The deposition method of claim 34, wherein substantially all
18 of the first-type surface is continuous and substantially all of the second-
19 type surface is continuous.

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21 38. The deposition method of claim 37, wherein the first-type
22 surface has a common border with the second-type surface.
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1 39. The deposition method of claim 34, wherein either the first-
2 or the second-type surface is insulative and the other is conductive.

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4 40. The deposition method of claim 34, wherein the first
5 initiation precursor forms a negligible, if any, amount of the initiation
6 layer on the second-type surface.
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1 41. A deposition method comprising:
2 contacting a first-type surface of a substrate and a second-type
3 surface of the substrate different from the first-type surface with a first
4 initiation precursor and forming an initiation layer substantially selectively
5 on the first-type surface relative to the second-type surface;

6 contacting the second-type surface with a second initiation
7 precursor and forming the initiation layer on the second-type surface;
8 and

9 contacting the initiation layer on the first-type surface and the
10 second-type surface with a deposition precursor and forming a deposition
11 layer over the first-type surface and the second-type surface.

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13 42. The deposition method of claim 41, wherein the initiation
14 layer and deposition layer each consist essentially of a monolayer.

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16 43. The deposition method of claim 41, wherein the first
17 initiation precursor forms a negligible, if any, amount of the initiation
18 layer on the second-type surface.

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20 44. The deposition method of claim 41, wherein the contacting
21 with the first initiation precursor and the contacting with the second
22 initiation precursor occur simultaneously.

1 45. The deposition method of claim 41, wherein substantially all
2 of the first-type surface is continuous and at least some of the second-
3 type surface is not continuous.

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5 46. The deposition method of claim 41, wherein either the first-
6 or the second-type surface is insulative and the other is conductive.

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8 47. The deposition method of claim 41, wherein the forming the
9 initiation layer on the second-type surface substantially fills holes in the
10 initiation layer.

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12 48. The deposition method of claim 41, further comprising
13 contacting the deposition layer with a third initiation precursor different
14 from both the first and second initiation precursor and forming a second
15 initiation layer on the deposition layer.